WHAT IS CLAIMED IS:

1. A cartridge detecting device for detecting a state of a cartridge to be removably installed on a working device, said cartridge detecting device comprising:

a passage formed within said cartridge and extending in a direction of movement of said cartridge for installation thereof on said working device, said passage having an opening open at one end of said cartridge in said direction of movement;

a projecting member insertable into said passage through said opening as said cartridge is moved for installation thereof on said working device, said projecting member being movable in said direction of movement;

a non-reversibly changing member disposed in said passage, at a predetermined distance from said opening, said non-reversibly changing member being changeable from a first state for a first relationship with said projecting member, to a second state for a second relationship with said projecting member, said non-reversibly changing member being unable to change from said second state back to said first state;

a first detector operable by said cartridge when said cartridge is moved for installation thereof on said working device;

a second detector operable by said projecting member during the movement of said cartridge for installation thereof on said working device; and

a determining portion connected to said first and second

detectors and determining the state of said cartridge on the basis of outputs of said first and second detectors.

2. The cartridge detecting device according to claim 1, wherein said non-reversibly changing member inhibits a relative movement of said cartridge and said projecting member when said non-reversibly changing member is placed in said first state, and permits said relative movement when said non-reversibly changing member is placed in said second state.

3. The cartridge detecting device according to claim 2, wherein said non-reversibly changing member comprises a generally planar member which inhibits insertion of a distal end portion of said projecting member into an inner portion of said passage located inwardly of said non-reversibly changing member within said cartridge, when said generally planar member is placed in said first state, and which permits the insertion of said distal end portion of said projecting member into said inner portion of said passage, when said generally planar member is placed in said second state.

4. The cartridge detecting device according to claim 1, wherein said cartridge and said first detector are arranged such that the output of said first detector changes a plurality of times as said cartridge is moved for installation thereof on said working device, and said determining portion is operable to determine the state of said cartridge on the basis of a plurality of combinations of the

outputs of said first and second detectors.

5. The cartridge detecting device according to claim 4, wherein said determining portion is operable to determine a state of said non-reversibly changing member on the basis of the output of said first detector generated when said cartridge is located at a predetermined position relative to said working device during said movement for installation thereof, and the output of said second detector which is generated in response to a position of said projecting member relative to said second detector.

6. The cartridge detecting device according to claim 1, wherein first detector is fixed to said working device, and said cartridge has a plurality of portions which are spaced from each other in said direction of movement and which are positioned relative to said first detector, so as to be engageable with said first detector during the movement thereof in said direction of movement, for thereby changing the output of said first detector.

7. The cartridge detecting device according to claim 1, wherein said determining portion is operable to determine that said cartridge is abnormal, on the basis of the output of said second detector generated when said second detector is operated by said projecting member, while the output of said first detector indicates that said non-reversibly changing member has not reached said projecting member.

8. The cartridge detecting device according to claim 1, wherein said determining portion is operable, after the output of said first detector has changed before said non-reversibly changing member reaches said projecting member during said movement of said cartridge for installation thereof on said working device, to determine whether said non-reversibly changing member is placed in said first state or said second state, on the basis of the output of said second detector generated when or after said non-reversibly changing member has reached said projecting member.

9. The cartridge detecting device according to claim 1, wherein said first detector is fixed to said working device, and said cartridge has a portion positioned relative to said first detector, so as to be engageable with said first detector during the movement thereof in said direction of movement, for thereby changing the output of said first detector, before said non-reversibly changing member reaches said projecting member, and wherein said second detector is fixed to said working device, and said projecting member is movable by said non-reversibly changing member, after said non-reversibly changing member has reached said projecting member, for thereby changing the output of said second detector.

10. A cartridge detecting device for detecting a state of a cartridge to be removably installed on a working device, said cartridge detecting device comprising:

a passage formed within said cartridge and extending in a direction of movement of said cartridge for installation thereof on said working device, said passage having an opening open at one end of said cartridge in said direction of movement;

a projecting member insertable into said passage through said opening as said cartridge is moved for installation thereof on said working device, said projecting member being movable in said direction of movement;

a non-reversibly changing member disposed in said passage, at a predetermined distance from said opening, said non-reversibly changing member being changeable from a first state to a second state, said non-reversibly changing member being unable to change from said second state back to said first state;

a detector device operable depending upon whether said non-reversibly changing member is placed in said first state or said second state, when said cartridge is moved for installation thereof on said working device; and

a determining portion operable to determine the state of said cartridge on the basis of an output of said detector device.

11. The cartridge detecting device according to claim 1, wherein said non-reversibly changing member is placed in said first state when a first force acts on said cartridge in said direction of movement thereof for installation thereof on said working device, said non-reversibly changing member in said first state engaging said projecting member so as to inhibit insertion of a distal end

portion of said projecting member into an inner portion of said passage located inwardly of said non-reversibly changing member within said cartridge, and permitting said projecting member to be moved with said cartridge in said direction of movement, said non-reversibly changing member changing from said first state to said second state when a second force larger than said first force acts between said projecting member and said non-reversibly changing member, said non-reversibly changing member in said second state permitting the insertion of said distal end portion of said projecting member into said inner portion of said passage.

12. The cartridge detecting device according to claim 10, wherein said non-reversibly changing member is placed in said first state when a first force acts on said cartridge in said direction of movement thereof for installation thereof on said working device, said non-reversibly changing member in said first state engaging said projecting member so as to inhibit insertion of a distal end portion of said projecting member into an inner portion of said passage located inwardly of said non-reversibly changing member within said cartridge, and permitting said projecting member to be moved with said cartridge in said direction of movement, said non-reversibly changing member changing from said first state to said second state when a second force larger than said first force acts between said projecting member and said non-reversibly changing member, said non-reversibly changing member in said

second state permitting the insertion of said distal end portion of said projecting member into said inner portion of said passage.

13. The cartridge detecting device according to claim 1, further comprising a stop member for stopping a movement of said projecting member together with said cartridge in said direction of movement of the cartridge while said non-reversibly changing member is held in engagement with said projecting member in said first state of said non-reversibly changing member, said stop member stopping said movement of said projecting member before said cartridge has been installed at a predetermined position of installation on said working device, said non-reversibly changing member changing from said first state to said second state when said cartridge is further moved in said direction of movement for installation thereof from a position at which said movement of the projecting member is stopped by said stop member.

14. The cartridge detecting device according to claim 12, further comprising a stop member for stopping a movement of said projecting member together with said cartridge in said direction of movement of the cartridge while said non-reversibly changing member is held in engagement with said projecting member in said first state of said non-reversibly changing member, said stop member stopping said movement of said projecting member before said cartridge has been installed at a predetermined position of installation on said working device, said

non-reversibly changing member changing from said first state to said second state when said cartridge is further moved in said direction of movement for installation thereof from a position at which said movement of the projecting member is stopped by said stop member.

15. The cartridge detecting device according to claim 1, wherein said cartridge is an ink cartridge having an ink reservoir, and said opening is communicated with an upper part of said ink reservoir, for introducing an atmosphere into said upper part when said non-reversibly changing member changes from said first state to said second state.

16. The cartridge detecting device according to claim 10, wherein said cartridge is an ink cartridge having an ink reservoir, and said opening is communicated with an upper part of said ink reservoir, for introducing an atmosphere into said upper part when said non-reversibly changing member changes from said first state to said second state.

17. A cartridge to be removably installed on a working device, said cartridge comprising:

a passage formed extending in a direction of movement of said cartridge for installation thereof on said working device, said passage having an opening which is open at one end of said cartridge in said direction of movement and through which a projecting member is insertable as said cartridge is moved in said

direction of movement for installation thereof on said working device; and

a non-reversibly changing member disposed in said passage, at a predetermined distance from said opening, said non-reversibly changing member being changeable from a first state for a first relationship with said projecting member, to a second state for a second relationship with said projecting member, said non-reversibly changing member being unable to change from said second state back to said first state.

18. The cartridge according to claim 17, which is an ink cartridge having an ink reservoir, and wherein said opening is communicated with an upper part of said ink reservoir, for introducing an atmosphere into said upper part when said non-reversibly changing member changes from said first state to said second state.

19. The cartridge according to claim 17, wherein said non-reversibly changing member inhibits a relative movement of said cartridge and said projecting member when said non-reversibly changing member is placed in said first state, and permits said relative movement when said non-reversibly changing member is placed in said second state.

20. The cartridge according to claim 19, wherein said non-reversibly changing member comprises a generally planar member which inhibits insertion of a distal end portion of said

projecting member into an inner portion of said passage located inwardly of said non-reversibly changing member within said cartridge, when said generally planar member is placed in said first state, and which permits the insertion of said distal end portion of said projecting member into said inner portion of said passage, when said generally planar member is placed in said second state.

21. The cartridge according to claim17, wherein said cartridge has a plurality of portions which are spaced from each other in said direction of movement and which are positioned relative to a first detector fixed to said working device, so as to be engageable with said first detector during the movement thereof in said direction of movement, for thereby changing an output of said first detector.

22. The cartridge according to claim 17, wherein said cartridge has a portion positioned relative to a first detector provided on said working device, so as to be engageable with said first detector during the movement thereof in said direction of movement, for thereby changing an output of said first detector, before said non-reversibly changing member reaches said projecting member, and said projecting member is movable by said non-reversibly changing member, after said non-reversibly changing member has reached said projecting member, for thereby changing an output of a second detector provided on said working device.

23. The cartridge according to claim 17, wherein said non-reversibly changing member is placed in said first state when a first force acts on said cartridge in said direction of movement thereof for installation thereof on said working device, said non-reversibly changing member in said first state engaging said projecting member so as to inhibit insertion of a distal end portion of said projecting member into an inner portion of said passage located inwardly of said non-reversibly changing member within said cartridge, and permitting said projecting member to be moved together with said cartridge in said direction of movement, said non-reversibly changing member changing from said first state to said second state when a second force larger than said first force acts between said projecting member and said non-reversibly changing member, said non-reversibly changing member in said second state permitting the insertion of said distal end portion of said projecting member into said inner portion of said passage.

24. The cartridge according to claim 17, which is an ink cartridge having an ink reservoir, and said opening is communicated with an upper part of said ink reservoir, for introducing an atmosphere into said upper part when said non-reversibly changing member changes from said first state to said second state.